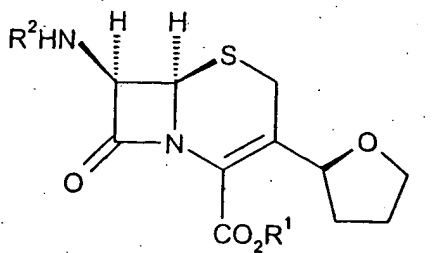


IN THE CLAIMS:

1. (Currently Amended) A process for preparing a 3-cyclic-ether-substituted cephalosporin of the formula I:

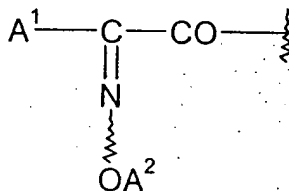


or a pharmaceutically acceptable salt thereof,

wherein

the group CO₂R¹ is a carboxylic acid or a carboxylate salt; and

R² has the formula:

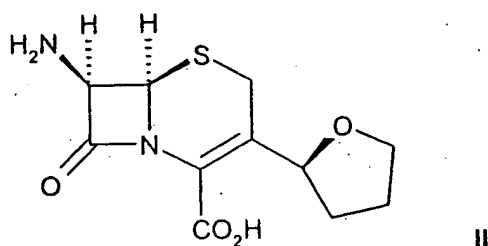


wherein

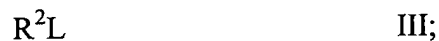
A¹ is selected from the group consisting of C₆₋₁₀aryl, C₁₋₁₀heteroaryl and C₁₋₁₀heterocyclyl;

A² is selected from the group consisting of hydrogen, C₁₋₁₆alkyl, C₃₋₁₀cycloalkyl, C₃₋₁₀cycloalkenyl, C₆₋₁₀aryl, C₁₋₆alkyl(CO)(C₁₋₆)alkyl-O-, HO(CO)(C₁₋₆)alkyl, mono-(C₆₋₁₀aryl)(C₁₋₆alkyl), di-(C₆₋₁₀aryl)(C₁₋₆alkyl), and tri-(C₆₋₁₀aryl)(C₁₋₆alkyl);

comprising reacting a compound formula II



with a compound of the formula III:



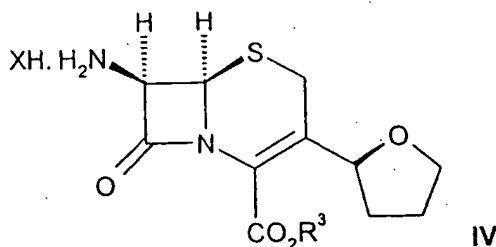
wherein

R^2 is as defined above; and

L is selected from the group consisting of hydroxy, halo, azido, mono-(C_{1-16} alkyl)carbonate, (C_{1-6} alkyl)carboxylate, (C_{6-10} aryl)carboxylate, mono-(C_{6-10} aryl)-(C_{1-6} alkyl)carboxylate, di-(C_{6-10} aryl)(C_{1-6} alkyl)carboxylate, di(C_{1-6} alkyl)phosphorothioate, (C_{1-6} alkyl)sulfonyl, mono-(C_{1-6} alkyl)(C_{6-10} aryl)sulfonyl, di-(C_{1-6} alkyl)-(CO)-S-, cyano- C_{1-6} alkoxy, C_{6-10} aryloxy, 3-benzthiazolyloxy, 8-quinolinyloxy and N-oxy-succinimidyl;

in the presence of a solvent, a base, an optional coupling agent and an optional catalyst.

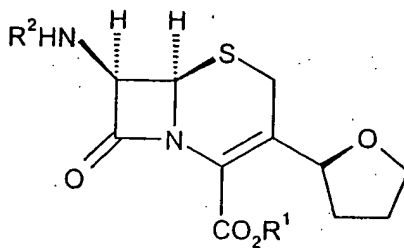
2. (Original) The process according to claim 1 further comprising the step of preparing said compound of formula II by reacting a compound of formula IV:



wherein R^3 is para-nitrobenzyl or allyl; and X is halo;

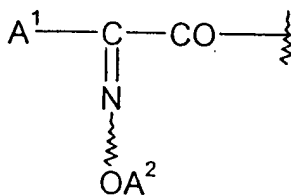
with a suitable deprotecting agent; in the presence of a solvent.

3. (Original) A process for preparing a 3-cyclic-ether-substituted cephalosporin of the formula I:



or a pharmaceutically acceptable salt thereof,

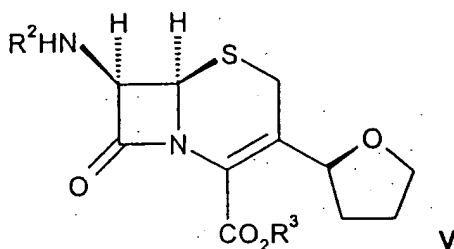
wherein the group CO_2R^1 is a carboxylic acid or a carboxylic salt; and R^2 has the formula:



wherein A^1 is selected from the group consisting of C_{1-10} aryl, C_{1-10} heteroaryl and C_{1-10} heterocyclyl;

A² is selected from the group consisting of hydrogen, C₁₋₆alkyl, C₃₋₁₀cycloalkyl, C₆₋₁₀aryl, C₁₋₆alkyl(CO)(C₁₋₆)alkyl-O-, HO(CO)(C₁₋₆)alkyl, mono-(C₆₋₁₀aryl)(C₁₋₆alkyl), di-(C₆₋₁₀aryl)(C₁₋₆alkyl) and tri-(C₆₋₁₀aryl)(C₁₋₆alkyl);

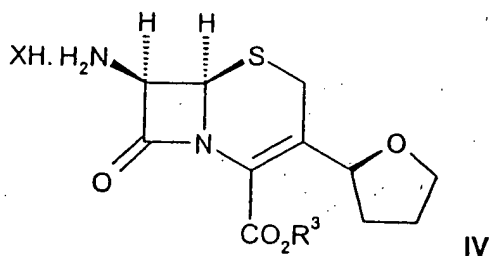
comprising reacting a compound of formula V:



wherein R² as defined above; and R³ is para-nitrobenzyl or allyl;

with a suitable deprotecting agent in the presence of a solvent.

4. (Currently Amended) The process according to claim 3 further comprising preparing said compound of formula V by reacting a compound of formula IV:



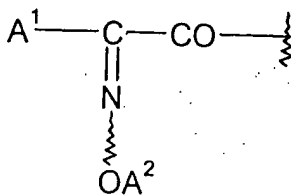
where R³ is para-nitrobenzyl or allyl; and X is halo;

with a compound of the formula III:



III;

wherein R² has the formula:



wherein A¹ is selected from the group consisting of C₆₋₁₀ aryl, C₁₋₁₀ heteroaryl and C₁₋₁₀ heterocyclyl;

A² is selected from the group consisting of hydrogen, C₁₋₆alkyl, C₃₋₁₀cycloalkyl, C₆₋₁₀aryl, C₁₋₆alkyl(CO)(C₁₋₆)alkyl-O-, HO(CO)(C₁₋₆)alkyl, mono-(C₆₋₁₀aryl)(C₁₋₆alkyl), di-(C₆₋₁₀aryl)(C₁₋₆alkyl) and tri-(C₆₋₁₀aryl)(C₁₋₆alkyl); and

L is selected from the group consisting of hydroxy, halo, azido, mono(C₁₋₆alkyl)carbonate, (C₁₋₆alkyl)carboxylate, (C₆₋₁₀aryl)carboxylate, mono-(C₆₋₁₀aryl)(C₁₋₆alkyl)carboxylate, di-(C₆₋₁₀aryl)(C₆₋₁₀alkyl)carboxylate, di(C₁₋₆alkyl)phosphorothioate, (C₁₋₆alkyl)sulfonyl, mono-(C₁₋₆alkyl)(C₆₋₁₀aryl)sulfonyl, di-(C₁₋₆alkyl)(C₆₋₁₀aryl)sulfonyl, (C₁₋₆alkyl)-(CO)-S-, cyano-C₁₋₆alkoxy, C₆₋₁₀aryloxy, 3-benzthiazolyloxy, 8-quinolinylloxy and N-oxy-succinimidyl;

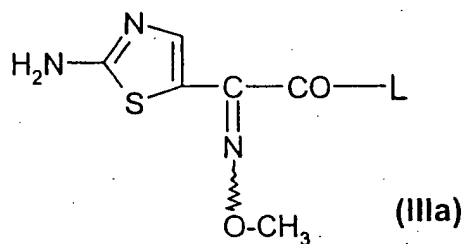
in the presence of a solvent.

5. (Original) The process according to claim 1, wherein said A¹ moiety of said R² is C₁₋₁₀heteroaryl selected from the group consisting of furyl, thienyl, pyridyl, aminothiazolyl and aminothiadiazolyl, wherein said amino moiety of said aminothiazolyl or aminothiadiazolyl is optionally protected.

6. (Original) A process according to claim 1, wherein said A² moiety of said R² is C₁₋₆ alkyl.

7. (Original): A process according to claim 1, wherein L of said compound of the formula III is selected from the group consisting of halo, methanesulfonyl, diethylphosphorothioate and 3-benzthiazolyloxy.

8. (Original) A process according to claim 1, wherein said compound of formula III has a formula IIIa:



and wherein L is selected from the group consisting of halo, methanesulfonyl, diethylphosphorothioate and 3-benzthiazolyloxy.

9. (Original) A process according to claim 1, wherein said solvent is water, acetone, tetrahydrofuran, ethyl acetate, dimethylacetamide, dimethylformamide, acetonitrile, methylene chloride, 1,2-dichloroethane or mixtures thereof.

10. (Original) A process according to claim 1, wherein said solvent is water, acetone, or mixtures thereof.

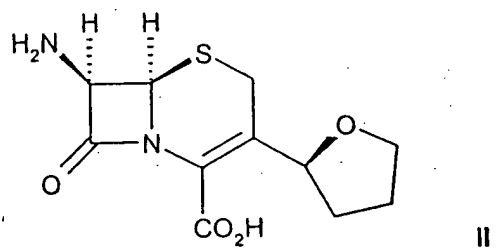
11. (Original) A process according to claim 1, wherein a catalyst is used.

12. (Original) A process according to claim 11 wherein said catalyst is a Lewis acid catalyst selected from the group consisting of boron trihalide and aluminum halide.
13. (Original) A process according to claim 1 wherein said base is diisopropylethylamine or sodium hydroxide.
14. (Original) A process according to claim 1, wherein said coupling agent is selected from the group consisting of N,N'-diethylcarbodiimide, N,N'-dipropyl carbodiimide, N,N'-diisopropylcarbodiimide, N,N'-dicyclohexylcarbodiimide, N-ethyl-N'-[3-(dimethylamino)propyl]carbodiimide, N,N'-carbonyldiimidazole and N,N'-carbonyldithiazole.
15. (Original) A process according to claim 1, wherein said coupling agent is N,N'-dicyclohexylcarbodiimide.
16. (Original) A process according to claim 1, wherein said X is chloro.
17. (Original) A process according to claim 2, wherein said R³ is para-nitrobenzyl and said suitable deprotecting agent is sodium dithionite or a catalytic hydrogenating agent.
18. (Original) A process according to claim 2, wherein said R³ is allyl and said suitable deprotecting agent is tetrakis triphenylphosphine palladium (0).

19. (Original) A process according to claim 17, wherein said solvent is acetone, water, tetrahydrofuran or mixtures thereof.

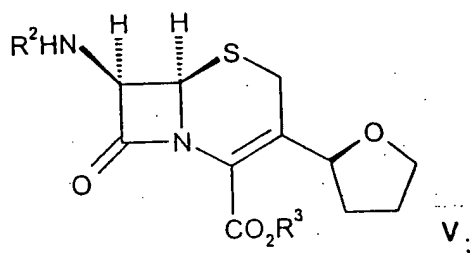
20. (Original) A process according to claim 4, wherein said solvent is methylene chloride, tetrahydrofuran or mixtures thereof.

21. (Original) A compound of formula II:



22. (Original) The compound according to claim 21 wherein said compound of the formula II has an enantiomeric or diastereomeric purity of 96% to 100%.

23. (Original) A compound of formula V:



wherein R^2 is acyl; and R^3 is para-nitrobenzyl or allyl.

24. (Original) The compound according to claim 23 wherein said compound of the formula V has an enantiomeric or diastereomeric purity of 96% to 100%.